Title: Variable step size Perturb and observe MPPT for PV solar applications

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Abstract: In order to deliver maximum output of photovoltaic (PV) cells, the usage of maximum power point tracking (MPPT) is essential. The speed and stability of the tracking technique are highly desired. Perturb and Observe (P&O) is one of the most common tracking techniques, but it suffers from the slow tracking speed at small duty cycle step and fluctuates when subjected with large duty step, which results in higher losses under dynamic weather to which the photovoltaic (PV) cells exposed. In this paper, variable step size Perturb and Observe is introduced throughout Matlab/Simulink simulation to overcome this problem to achieve higher efficiency, reliable tracking accuracy and higher speed under fast changing weather. In comparison with other variable P&O techniques, the proposed method features a dynamic step size for more tracking efficiency and accuracy. Double diode modelling is used in this technique for better photovoltaic (PV) cell's characteristic prediction. In this study, the adapted technique had been tested to wide range of sun irradiance and operation temperatures.